

## Transportation needs Carbon Negative Concrete and Aggregates

*Calera's Goal:*

*"Federally-funded state transportation and infrastructure projects shall utilize, to the extent available, products or materials that sequester and beneficially re-use greenhouse gases captured from emission sources in stable, environmentally benign, and permanent forms such as sand, aggregate, and cementitious materials."*

### **The Calera process could support several existing policies developed by the U.S. Department of Transportation related to enhancing the sustainability of highways:**

1. Reduce Carbon – Calera products sequester carbon and are then used to build roads and in other green building efforts.
2. "Better than Before" – As the transportation system is improved we now have the choice to use materials that preserve the natural and human environment.
3. Innovation in Projects – We offer a unique product that can be used in the aggregate form with asphalt/concrete and in the cementitious form with concrete.
4. Triple Bottom Line – These products are produced with a minimal carbon footprint, low energy needs and minimal environmental impact while producing jobs.

### **Who is Calera?**

Calera was founded by Brent Constantz, PhD, who holds over 60 patents in the field of specialty cements and has built three successful firms in the last decade. Backed by Khosla Ventures, Calera has engaged a team of scientists and engineers to move beyond the laboratory, and has established a 200-acre pilot facility to scale the process up to production levels. Calera's corporate headquarters and primary laboratory facilities are located in Los Gatos, CA.

### **The Calera Process**

The Calera process starts with a water source and waste CO<sub>2</sub> from sources such as coal-fired power plants. The process produces clean water and building materials that capture and permanently sequester CO<sub>2</sub> inside the mineral composition of the building materials. Among the potential products of the Calera process are cementitious materials, which can be used to supplant some or all of the portland cement in the production of quality concrete. Concrete is the most durable of building materials – by producing roadways, buildings, and infrastructure from a concrete that contains significant levels of sequestered carbon, architects, engineers and agency officials have the opportunity to provide sustainable infrastructure while dramatically reducing greenhouse gas emissions, both from the source of the captured emissions and from the production of portland cement. Perhaps the most exciting part of the Calera process is its ability to help make electricity produced from coal with almost no carbon footprint, making our abundant coal resources usable for the production of clean energy.

### **Calera Technological Breakthroughs:**

- Allows capture of CO<sub>2</sub> without the need to separate it from flue gas reducing energy use
- Scales up to store CO<sub>2</sub> into the world's most widely used building material
- Recovers power plant waste heat and water minimizing carbon footprint
- Incorporates waste by-products of coal power plants currently being land filled

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- Potentially mitigates other criteria pollutants, such as mercury, nitrogen oxides, particulate matter, and sulfur dioxide
- Adapts to any point source of CO<sub>2</sub> beyond fossil fueled fired power plants
- Allows to offset portland cement carbon footprint
- Provides a cost effective CO<sub>2</sub> emission control technology
- Converts seawater or wastewater into fresher water